
NAVFAC IGS-13704 (February 2003)

Preparing Activity: LANTNAVFACENGCOM Based on NFGS-13704

ITALIAN GUIDE SPECIFICATIONS

Use for ITALIAN projects only

SECTION 13704

CCTV MONITORING SYSTEM FOR CHILD DEVELOPMENT CENTERS
02/03

NOTE: This guide specification is issued by the
Atlantic Division, Naval Facilities Engineering
Command for regional use in Italy.

NOTE: This sample specification covers the
requirements for CCTV monitoring systems consisting
of commercial equipment which is limited to a full
range of closed-circuit television (CCTV) for remote
alarm assessment purposes, alarm signal data
communications media, alarm reporting and monitoring
systems, and basic card entry control systems. The
CCTV system covered in this specification is not
intended for exterior perimeter surveillance usage.
System requirements must conform to NAVFAC DM-13.02.
Consult the Engineering Field Division (EFD), Naval
Facilities Engineering Command on questions
concerning system design.

NOTE: The following information shall be shown on
the project drawings:

1. Floor plans: Location of security devices,
control units, alarm display equipment, and
electrical power cabinets;
2. Site plan: Exterior devices and routing of
conductors and conduit into building;
3. Single line type system riser diagram.
Connection of equipment should be indicated for
typical system chosen for cost estimating purposes;
4. Single line type electrical riser diagram; and

5. Mounting: Details for each device required for complete installation, including junction boxes for recessed BMS where required. Include device height and installation of wiring.

The device symbol presents an easy to use and efficient means of identifying the essential features of the security engineering design effort. The symbol provides a method by which the phenomenology of the device, necessary identifying details related to the phenomenology of the device, and the means by which the device is positioned or mounted can be readily indicated on the engineering plans. The symbol also provides a means of identifying the device in order to develop accurate bills of material and system diagrams. The tables presented are suggested usage and can be modified as necessary to suit the particular design effort.

The "Completed Device Legend" is presented to illustrate actual devices and the legend detail needed on submitted plans.

DESIGN SYMBOLOGY

Note:

1. Device type: A single letter code used to indicate the phenomenology of the device. Refer to the device type list.
2. Device detail: A single letter code used to differentiate between similar type devices. Refer to the device detail list.
3. Mounting detail: A single letter code used to indicate the mounting means or positioning of the device. Refer to the mounting detail list.
4. Identifier: Can be any alphanumeric sequence which allows identification of individual device. Room number with alpha character is particularly effective for interior plans which have specific room numbers previously assigned.
5. Locator: Small 3 mm dot which indicates the physical location of the device on the plans. Locator dot can be used with an arrow to indicate the location of directional devices, such as a CCTV camera, or with dashed lines to indicate fence mounted or buried line type devices. The symbol should be clarified in the legend and the plans.

6. Symbol: A 15 mm or greater diameter circle with a horizontal line through the center. Can be changed to a square or hexagon of similar size, if necessary, for clarity on the drawings. The size is dictated by the height of letters used for the device nomenclature.

First Letter - Sensor Type (Phenomenology)

A	Acoustic
B	Balanced Magnetic Switch
C	Card Reader
D	Door Strike
E	Electrical Strain Sensitive
F	Fence Sensor
G	Glass Break
H	Reserved
J	Door Bolt
K	Capacitance
L	Photoelectric
M	Microwave
N	Radiation
P	Passive Infrared
R	Area Lighting
S	Switch (Contact)
T	Intercom
U	Ultrasonic
V	Video
W	Seismic (Vibration and Switchmat)
X	Ported Coaxial Cable
Y	Reserved
Z	Reserved

Second Letter - Sensor Detail

A	Ultracon
B	Intensified Silicon Intensified Target
C	Curtain
D	Vidicon
E	Angled left [_____] [radians] ([_____] [radians] from surface)
F	Reserved
G	Angled right [_____] [radians] ([_____] [radians] from surface)
H	Reserved
J	Reserved
K	Keypad
L	Long Range
M	Masked Coverage (Add Note to Legend & Spec for detail)

Second Letter - Sensor Detail

N	Reserved
P	Processor
R	Recessed
S	Surface
T	Transmitter
U	Receiver
V	Volume
W	Reserved
X	Reserved
Y	Reserved
Z	Reserved

Third Letter - Mounting Detail

A	Above Ceiling (above suspended ceiling)
B	Buried (Underground) (in pour or slab)
C	Ceiling Mounted
D	Duct Mounted
E	System Output to Control External Equipment
F	Flush Mounted
G	System Input From External Equipment
H	Header Mounted (above door opening)
J	Jamb Mounted (beside door opening)
K	Reserved
L	Reserved
M	Reserved
N	Reserved
P	Pole Mounted (i.e., exterior CCTV)
R	Recess Mounted
S	Surface Mounted
T	Table and Desk Mounted
U	Under Floor (below raised floor)
V	Reserved
W	Wall Mounted
X	Suspended
Y	Reserved
Z	Reserved

Completed Device Legend

ADT	X-Ray Unit Display Monitor, Desk Mounted
ADE	X-Ray Video Source
BRH	Balanced Magnetic Switch, Recess Mounted at Door Header
BSF	Balanced Magnetic Switch, Surface Mounted in Floor
BSH	Balanced Magnetic Switch, Surface Mounted at

Completed Device Legend

	Door Header
BSP	Balanced Magnetic Switch, Surface Mounted on Post
BSJ	Balanced Magnetic Switch, Surface Mounted in Jamb of Door
CKP	Card Reader With Keypad, Post Mounted
CKW	Card Reader With Keypad, Wall Mounted
CM	Control Monitoring Unit
CS	Control Station Used With Ultrasonic Sensors
CPU	Central Processing Unit
CXP	Card Reader Without Keypad, Post Mounted
CXW	Card Reader Without Keypad, Wall Mounted
DRJ	Electric Door Strike, Recessed, Jamb Mounted
GYE	Ventilation System Butterfly Valve Output to Open Circuit in Equipment Supplied by Others
GYG	Ventilation System Butterfly Valve Input From Open Position Sensing Device
GZE	Ventilation System Butterfly Valve Output to Close Circuit in Equipment Supplied by Others
GZG	Ventilation System Butterfly Valve Input From Close Position Sensing Device
HYG	Ventilation System Blast Valve Input from Open Position Sensing Device
HZE	Ventilation System Blast Valve Output to Close Circuit
JSH	Door Bolt Locking Device, Surface Mounted at Door Header
LTW	Active Infrared Transmitter, Wall Mounted
LUW	Active Infrared Receiver, Wall Mounted
MUS	Metal Detector, Surface Mounted
NUS	Radiation Detector, Surface Mounted
PCC	Passive Infrared, Curtain, Ceiling Mounted
PCW	Passive Infrared Sensor, Curtain Detection, Wall Mounted
PMW	Passive Infrared Sensor, Masked; Detection to Left, Wall Mounted
PNW	Passive Infrared Sensor, Masked; Detection to Right, Wall Mounted
PVW	Passive Infrared Sensor, Volume Detection, Wall Mounted
RYE	Area Lighting Output to Energize Circuit in Equipment Supplied by Others
SRF	Switch Contact, Recessed, Floor Mounted
SRH	Switch Contact, Recessed, Header Mounted
SWG	Uninterruptible Power Supply Status Input From Sensing Device
SYE	Output Contact to Energize Door Open Circuit in Equipment Supplied by Others
SZE	Output Contact to Energize Door Close Circuit in Equipment Supplied by Others
TJT	Audio Communication Transceiver, Table Top

Completed Device Legend

TJW	Audio Communication Transceiver, Wall Mounted
UEW	Ultrasonic Sensor, Detection Angled Left [1.31 rad] [(0.262 rad] From Surface), Wall Mounted
UGW	Ultrasonic Sensor, Detection Angled Right [1.31 rad] [(0.262 rad] Surface), Wall Mounted
UVC	Ultrasonic Sensor, Volume Detection, Ceiling Mounted
UVW	Ultrasonic Sensor, Volume Detection, Wall Mounted
VAC	Video, Ultracon Camera, Ceiling Mounted
VAP	Video Ultracon Camera, Pedestal Mounted
VAW	Video, Ultracon Camera, Wall Mounted
VBP	Video, Isit Camera, Pole Mounted
VDX	Video, Display Monitor, Console Mounted
VOC	Video, Vidicon Camera, Ceiling Mount
WYG	Potable Water Isolation Valve Input From Open Position Sensing Device
WZW	Potable Water Isolation Valve Output to Close Circuit in Equipment Supplied by Others
XPB	Ported Coax, Data Processor, Mounted in Buried Vault Enclosure
XWW	Ported Coax, Data Control Interface Unit, Wall Mounted
YTT	Keypad Unit, Stand-Alone, Desk Mounted
ZTT	Personal Identity Verifier, Stand-Alone, Desk Mounted

Comments and suggestion on this specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

EUROPEAN QUALITY MARK (CE)

NOTE: CE (European Community) is a European quality marking system indicating that the equipment or product conforms to EEC (European Economic Community) standards concerning quality of safety and health and conforms with all the Italian technical standards in force. All products (Electrical, Mechanical and Electronic Equipment and similar items) that are marked CE conform to the standards and Laws enforced in Europe. In Italy, the CE marking is a mandatory requirement and must be shown on all applicable equipment and products attesting to the conformity with the EEC standards.

CE

European Quality Mark

ITALIAN ELECTROTECHNICAL COMMITTEE (CEI)

NOTE: A CEI Norm is an Italian technical normative for electrical systems recognized by Italian Law, submitted by a private organization "Comitato Elettrotecnico Italiano" for the Italian territory, available in the Italian language and only in some cases in English.

CEI 64-8; V1; V2	(1998;01;01) Electrical installations of buildings
CEI 79-2;Ab	(1998;01) Intruder, hold up and antiattack alarm systems - Particular requirements for apparatus
CEI 79-3	(1998) Intruder, hold up and antiattack alarm systems - Particular requirements for intruder installations
CEI 79-11	(1999) Centralization of security information - Security requirement

ITALIAN/EUROPEAN HARMONIZATION STANDARDS (UNI EN)(UNI ENV)(CEI EN)
(UNI EN ISO)(UNI ISO)

NOTE: A UNI EN, UNI ENV, CEI EN, UNI EN ISO or UNI ISO is a European Standard with a coincident Italian National Standard or International Standard. The two standards are identical, with most (but not all) EN's available in the English language and the UNI available only in the Italian

language.

UNI EN ISO 1461	(1999) Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods
UNI EN 12534	(2001) Welding consumables - Wire electrodes, wires, rods and deposits for gas shielded metal arc welding of high strength steels - Classification
CEI EN 50130-4	(1996) Alarm systems - Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder and social alarm system
CEI EN 50131-1	(1998) Alarm systems - Intrusion systems - Part 1: General requirements
CEI EN 50132-2-1	(1998) Alarm systems - CCTV surveillance systems for use in security applications - Part 2-1: Black and white cameras
CEI EN 50132-7	(1997) Alarm systems - CCTV surveillance systems for use in security applications - Part 7: Application guidelines
CEI EN 60051-8	(1997) Direct acting indicating analogue electrical measuring instruments and their accessories - Part 8: Special requirements for accessories
CEI EN 60439-1	(1998) Low-voltage switchgear and controlgear assemblies - Part 1: Type-tested and partially type-tested assemblies
CEI EN 60529;A1	(1997;00) Degrees of protection provided by enclosures (IP Code)

1.2 RELATED REQUIREMENTS

Section 16050, "Basic Electrical Materials and Methods," applies to this section with the additions and modifications specified herein.

1.3 DEFINITIONS

- a. Fail-safe: The capability to monitor system functions and report an alarm when a failure is detected in a critical system function.
- b. Installer: Either the Contractor or a subcontractor with whom the Contractor has a firm contractual agreement.

- c. Intruder: An animate object at least 1220 mm in height, 34 kg in weight and 0.113 cubic meter in volume, moving through the protected zones or portals at a velocity of 30 to 3000 mm per second.
- d. Sensor zone: A geographic position for which an intrusion must be identified and displayed and may be the combination of multiple detection devices.
- e. Element: As used in this section means a constituent part of a complex signal such as an ac or dc voltage or current, ac phase, or frequency duration.

1.4 SYSTEM DESCRIPTION

Provide an Audio/Video Monitoring System for the purpose of monitoring activity in a Child Development Center. The system shall record video and audio inputs. The system shall consist of cameras, microphones, monitors, multiplexers, time lapse video recorders, tape recorders, door sensors, key pads, a bell and associated wiring and accessories. Provide conduit and other materials not normally furnished by the manufacturer of the equipment listed above as specified in Section 16402, "Interior Distribution System."

Equipment provided shall be compatible and shall work together to provide a complete and functioning system. The audio recording and video shall be performed separately.

1.5 SUBMITTALS

NOTE: The "G" in asterisk tokens following each submittal item indicates Government approval and should be retained as long as a special reviewer is cited. Add "G" in asterisk tokens following any added submittals that are determined to require review by another organization and Governmental approval. Submittal items not designated with a "G" will be reviewed and approved by the CQC organization. If a special reviewer is cited, retain the second bracketed sentence.

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-02 Shop Drawings

System components; G

Overall system schematic; G

SD-03 Product Data

Interior point sensors; G

Keypad; G

Communications cable; G

Control Communicators; G

CCTV camera; G

CCTV lenses; G

Auxiliary CCTV camera equipment; G

Video switchers; G

Video monitors; G

Video tape recorder; G

Access key pads; G

Control units; G

Sixteen quadrant multiplexer; G

Audio recording equipment; G

Power supply for cameras; G

SD-06 Test Reports

System operational test; G

System final test; G

User's Software Data; G

SD-07 Certificates

System operational test plan; G

Installer's qualifications; G

Instructor's qualifications; G

SD-10 Operation and Maintenance Data

CCTV monitoring system components, Data Package 5; G

1.6 QUALITY CONTROL

1.6.1 Evidence of Experience and Qualifications

a. Show that the installer who will perform the work has a minimum of

2 years experience successfully installing intrusion detection systems, closed circuit TV systems, and audio recording equipment of the same type and design as specified herein. Include the names, locations, and points of contact of at least two installations of the same type and design as specified herein where the installer has installed such systems. Indicate the type of each system and certify that each system has performed satisfactorily in the manner intended for a period of not less than 12 months.

- b. Show that the instructor, who will train operating and maintenance personnel, has received a minimum of 24 hours of IDS training from a technical organization such as the National Burglar and Fire Alarm Association, and 2 years experience in the installation of systems of the type specified.

1.6.2 Installer's Qualifications

Prior to installation, submit data of the installer's experience and qualifications specified in paragraph entitled "Evidence of Experience and Qualifications."

1.6.3 Instructor's Qualifications

Prior to installation, submit data of the instructor's experience and qualifications as specified in paragraph entitled "Evidence of Experience and Qualifications."

1.6.4 Regulatory Requirements

Provide only CE listed IDS components except for exterior IDS sensors and access control. Closed circuit televisions (CCTV) and audio recording equipment are not required to be CE listed.

1.6.5 User's Software Data

Submit for approval not later than 30 days prior to formal operational testing or instruction to Government personnel on Audio Recording software. Audio Recording software shall be documented in the user's manual.

1.6.6 System Operational Test Plan

Submit at least 30 days prior to commencement of formal operational testing. Include detailed procedures for operational testing of each IDS component and subsystem, and for performance of an integrated system test.

1.6.7 System Components

Submit drawings that clearly and completely indicate the function of each system component. Indicate termination points of devices, and interconnections required for system operation. Indicate interconnection between modules and devices. In addition, submit a layout drawing showing spacing of components, location, mounting and positioning details.

1.6.8 Overall System Schematic

Indicate the relationship of integrated components on one diagram and show power source, system controls, impedance matches; plus number, size, identification, and maximum lengths of interconnecting wires. Drawings shall be not less than 280 by 432 mm.

1.6.9 Operation and Maintenance Data

Submit operation and maintenance data for CCTV monitoring system components in accordance with Section 01781, "Operation and Maintenance Data" and Section 16050, "Basic Electrical Materials and Methods."

PART 2 PRODUCTS

2.1 SOURCE MANUFACTURERS

2.1.1 Component Enclosures

The following manufacturers provide consoles, annunciator housings, power supply enclosures, sensor control and terminal cabinets and similar component enclosures that generally comply with these specifications:

APW ELECTRONICS srl
Corso Lombardia, 52
Regione Pescarito 1009
S. Mauro Torinese
Tel: 011-2734352
Fax: 011-2735801
www.apw-enclosures.com

QUANTE TRUCCO S.p.A.
via Giani, 1/3
15045 Sale (AL)
Tel: 0131-844212
Fax: 0131-844265
www.trucco.it

2.1.2 Interior Point Sensors

The following manufacturers provide interior point sensors that generally comply with these specifications:

HONEYWELL
Via Cannizzaro, 83/a
00156 Roma
Tel: 06-43981.1
Fax: 06-43981.258
www.cerberus.it

GUARDALL Srl
Via S. Quasimodo, 12
20025 Legnano (MI)
Tel: 0331-577677

Fax: 0331-578098
www.guardall.it

2.1.3 Keypad Access Control

The following manufacturers provide keypad access control devices that generally comply with these specifications:

SIEMENS CERBERUS
Via Benedetto Croce, 68
00142 Roma
Tel: 06/549381
Fax: 06/5401888
www.cerberus.it

ADEMCO Italia S.p.A.
Via Della Resistenza N. 53/59
20090 Buccinasco (MI)
Tel: 02-457-1791
Fax: 02-4570-1034
dbweb.agora.stm.it/market/ademco/home.htm

2.1.4 Control Communicators

The following manufacturers provide control communicator components that generally comply with these specifications:

SIEMENS CERBERUS
Via Benedetto Croce, 68
00142 Roma
Tel: 06/549381
Fax: 06/5401888
www.cerberus.it

ADEMCO
Via Della Resistenza, 53/59
20090 Buccinasco (MI)
Tel: 02-4571791
Fax: 02-45701034

2.1.5 Audible Alarms

The following manufacturers provide audible alarm components that generally comply with these specifications:

SIEMENS CERBERUS
Via Benedetto Croce, 68
00142 Roma
Tel: 06/549381
Fax: 06/5401888
www.cerberus.it

BENTEL SECURITY
Via Florida, 3

63013 Grottammare (AP)
Tel: 0735-735200
Fax: 0735-634355
www.bentelsecurity.com

2.1.6 Communication and Transmission Cable

The following manufacturers provide communications cable and video transmission cable components and materials that generally comply with these specifications:

PIRELLI
Via Sarca, 222
20126 Milano
Tel: 02/64421
Fax: 02/64429264
www.pirelli.com

NEXANS Italia
CAPIATI D. SAS (Representative)
Via L. Pigorini 24
00162 Roma (CAP)
Tel: 06-4423-5721
Fax: 06-4423-6338
www.nexans.com

ITALIANA CONDUTTORI Srl
vl. Zanotti, 94
27027 Gropello Cairoli (PV)
Tel: 0382-815150
Fax: 0382-814970
www.cavel.it

2.1.7 CCTV Cameras

The following manufacturers provide CCTV camera equipment that generally complies with these specifications:

ACI S.r.l. Farfisa Intercoms
Via Loretana, 134
60021 Camerano (AN)
Tel: 071-959631
Fax: 071-95150
e-mail: aciservice@acifarfisa.it

PHILIPS
Via G. Casati, 23
20052 Monza (MI)
Tel: 039/2036602
Fax: 039/2036511
www.philips.com

PANASONIC ITALIA S.p.A.
via G. Lucini, 19

20125 Milano
Tel: 02-67881
Fax: 02-66713316
www.panasonic.it

2.1.8 Video Switchers

The following manufacturers provide video switcher equipment that generally complies with these specifications:

PHILIPS
Via G. Casati, 23
20052 Monza (MI)
Tel: 039/2036602
Fax: 039/2036511
www.philips.com

HONEYWELL
Via Cannizzaro, 83/a
00156 Roma
Tel: 06-43981.1
Fax: 06-43981.258
www.cerberus.it

2.1.9 Video Sync Amplifier

The following manufacturers provide video sync amplifier equipment that generally complies with these specifications:

PHILIPS
Via G. Casati, 23
20052 Monza (MI)
Tel: 039/2036602
Fax: 039/2036511
www.philips.com

MELCHIONI ELETTRONICA S.p.A.
via P. Colletta, 37
20135 Milano
Tel: 02-5794241
Fax: 02-5794320
www.melchioni.it

2.1.10 Video Monitors

The following manufacturers provide video monitors that generally comply with these specifications:

PHILIPS
Via G. Casati, 23
20052 Monza (MI)
Tel: 039/2036602
Fax: 039/2036511
www.philips.com

HONEYWELL
Via Cannizzaro, 83/a
00156 Roma
Tel: 06-43981.1
Fax: 06-43981.258
www.cerberus.it

2.1.11 Video Tape Recorders

The following manufacturers provide video tape recorder equipment for CCTV systems that generally comply with these specifications:

PHILIPS
Via G. Casati, 23
20052 Monza (MI)
Tel: 039/2036602
Fax: 039/2036511
www.philips.com

HONEYWELL
Via Cannizzaro, 83/a
00156 Roma
Tel: 06-43981.1
Fax: 06-43981.258
www.cerberus.it

2.1.12 Multiplexers

The following manufacturers provide multiplexers that generally comply with these specifications:

PHILIPS
Via G. Casati, 23
20052 Monza (MI)
Tel: 039/2036602
Fax: 039/2036511
Web Site: www.philips.com

PANASONIC ITALIA S.p.A.
via G. Lucini, 19
20125 Milano
Tel: 02-67881
Fax: 02-66713316
www.panasonic.it

2.1.13 Control Units

The following manufacturers provide control units that generally comply with these specifications:

SIEMENS CERBERUS
Via Benedetto Croce, 68
00142 Roma

Tel: 06/549381
Fax: 06/5401888
www.cerberus.it

HONEYWELL
Via Cannizzaro, 83/a
00156 Roma
Tel: 06-43981.1
Fax: 06-43981.258
www.cerberus.it

2.1.14 Audio Recording Equipment

The following manufacturers provide audio recording equipment suitable for use with CCTV systems that generally comply with these specifications:

SONY BROADCAST & PROFESSIONAL ITALIA
Via Galileo Galilei, 40
20092 Cinisello Balsamo - Milano
Tel: 02-618381
Fax: 02-6126690

TEAC ITALIANA S.p.A.
Via C. Cantu, 11
20092 Cinisello Balsamo - Milano
Tel: 02-66010500

2.1.15 Microphones

The following manufacturers provide microphone equipment suitable for use with CCTV systems that generally comply with these specifications:

AKG ACOUSTICS Ges.m.b.H
Lembockgasse 21-25
A-1230 Viena, Austria
Tel: 43-1-86654-0

Sennheiser electronic
Am Labor 1
Wennebostel
30900 Wedemark, Germany
Tel: +49 (0)5130 600 0
Fax: +49 (0)5130 600 300
www.sennheiser.com

2.2 AUDIO/VIDEO MONITORING SUBSYSTEMS

Provide a complete integrated IDS consisting of the following major subsystems:

- a. Intrusion Detection System (IDS)
- b. Communications

- c. Closed-circuit television (CCTV)
- d. Alarm reporting and display
- e. Power
- f. Audio Recording

2.3 INTEGRATED SYSTEM FUNCTIONAL REQUIREMENTS

Provide specific subsystems consisting of the following:

- a. IDS subsystem: Sensors to detect intrusion attempts.
- b. Communications subsystem: Elements required to ensure that pertinent data is transferred from point of origin to point where appropriate actions can be taken.
- c. CCTV subsystem: Electronic devices required to record visual images for child care monitoring purposes and to provide visual assessment of IDS alarms.
- d. Alarm reporting and display subsystem: Electronic devices to control, process, integrate, and annunciate IDS data at separate locations.
- e. Power subsystem: Components required to ensure continuous operation of the entire system.
- f. Audio recording: Electronic devices required to record audio activity for monitoring purposes.

2.3.1 Growth Capability

Provide capability for modular IDS expansion with minimal equipment modification. Products provided shall not limit growth capability to products of a single manufacturer.

2.4 IDS SYSTEM PERFORMANCE REQUIREMENTS

The installed and operating IDS shall be integrated into the overall facility to detect intrusion and shall perform as an entity, as specified below.

2.4.1 Detection Coverage

Provide and adjust sensors so that coverage is maximized without mutual interference. IDS coverage shall include critical spaces within the facility.

2.4.2 Detection Resolution (Sensitivity)

Sensitivity shall be capable of the following:

- a. Locating intrusions at individually protected doors as indicated;
- b. Locating failures or tampering at individual sensors.

2.4.3 Detection Alarm and Reporting Capacity

NOTE: Select system capacity parameters based on the specific facility design requirements. System capacity should be expressed as a binary number. Include a 25 percent expansion factor to accommodate changes in design caused by reconfiguration of equipment within interior spaces or renovation.

The IDS shall have the capacity to collect, communicate, and display up to 12 sensor zone alarms and to enable control of two response devices in each of the sensor zones. If the sensor zone is a combination of multiple alarm sources, the system shall maintain the capability to identify individual sensors in an alarm state. A single alarm shall be annunciated within one second average, 2 seconds maximum, after sensor transducer or other detection device activation.

2.4.4 IDS Alarms

Alarms shall include but not be limited to the following:

- a. Intrusion detection
- b. Tamper switches
- c. Fail-safe capability
- d. Line fault (for hardwire systems only) detection
- e. Power loss detection

2.4.4.1 Intrusion Detection

Include door strikes as indicated and specified. When door strike sensor indicates Alarm, the IDS will send a signal to the CCTV system to exclusively record from a designated camera for a user selectable time period between 2 and 5 minutes and alarm shall be annunciated and be clearly distinguishable for other types of alarm. Also, the alarm shall cause bell to sound.

2.4.4.2 Tamper Switches

Enclosures, cabinets, housings, boxes, raceways, and fittings with hinged doors or removable covers which contain circuits of the intrusion detection system and associated power supplies shall be provided with cover having corrosion-resistant tamper switches. Arrange tamper switches to initiate an alarm signal when the door or cover is moved as little as 6 mm from the normally closed position. Mechanically mount tamper switches to maximize

defeat time when enclosure covers are opened or removed. Minimum amount of time required to depress or defeat the tamper switch after opening or removing the cover shall be one second. Enclosure and tamper switch shall prevent direct line of sight to internal components and prevent switch or circuit tampering. Conceal mounting hardware so switch cannot be observed from enclosure exterior. Covers of junction boxes provided to facilitate initial installation of the system need not be provided with tamper switches if covers contain no splices or connections. Tamper alarms shall be annunciated to be clearly distinguishable from intrusion detection alarms. Tamper switches on doors which must be opened to make normal maintenance adjustments to the system and to service power supplies shall be the push/pull-set, automatic-reset type. Tamper switches are not required in boxes above drop ceiling. Tamper switches shall be:

- a. Inaccessible until switch is activated;
- b. Under electrical supervision at all times, irrespective of the protection mode in which the circuit is operating;
- c. Spring-loaded and held in the closed position by the door, or cover protected;
- d. Wired to break the circuit when the door or cover is disturbed; and
- e. Wired so that each sensor and device is annunciated by zone at the central reporting processor.

2.4.4.3 Fail-Safe Capability

Provide fail-safe capability in critical elements of the IDS. This shall include, but not be limited to, capability to monitor communication link integrity and to provide self-test. When diminished functional capabilities are detected, system shall provide annunciation of the fault. Fail-safe alarms shall be annunciated to be clearly distinguishable from other types of alarms.

2.4.4.4 Line Fault Detection

As a minimum, fault isolation at the systems level shall have the same geographic resolution as provided for intrusion detection. Communication links of the IDS shall have an active mode for line fault detection. System shall be either a static, or dynamic system. In a static system, the "no-alarm" condition shall always be represented by the same signal, which shall be different than the signal originally transmitted. The dynamic system shall represent "no-alarm" with a signal which continually changes with time.

2.4.4.5 Power Loss Detection

Provide capability to detect when a critical component of the system experiences temporary or permanent loss of power and to declare an alarm. Alarm shall be annunciated to clearly identify the component experiencing power loss.

2.4.5 Self-Test

Provide self-test capability for sensors, display lights, and other elements which are not inherently self-tested by virtue of continuous operation. Initiation of a test command shall be by both automatic and manual means. Provide manual sensor test initiation capability by both the IDS control unit and at command elements of the alarm reporting and display subsystem. Sensor test command signal shall initiate an intrusion simulation which shall cause the sensor to test as much of itself, including the transducer, as is reasonable and shall result in the generation of an alarm condition.

2.4.6 Electrical Power

Obtain by the normal commercial or base electrical distribution system. Power shall be continuously monitored.

2.4.6.1 Primary Power

Furnish 220 volt ac service, transformed through a two-winding isolation transformer and rectified to low-voltage dc for system operation. Obtain primary power at the location indicated. Provide a separate, lockable, circuit breaker at the location indicated.

2.4.6.2 Backup Power

Provide backup power to the primary power by by dedicated batteries in remotely located system elements such as individual sensors or control units in each element or subsystem as may be appropriate to provide a minimum of 4 hours of power without recharge or replacement. When radio frequency (RF) operation is required, batteries shall be an integral part of dispersed system elements. Batteries shall be capable of operation in any position and shall be protected against venting caustic chemicals or fumes within an equipment cabinet.

2.5 AUDIO/VIDEO MONITORING SYSTEM PERFORMANCE REQUIREMENTS

Design system components to operate as described herein. Perceived inconsistencies between the following component performance specifications and overall system level performance descriptions shall be decided in favor of the former.

2.5.1 Modularity

Provide components designed for modular increase or decrease of system capability by adding to system without replacing any components. Design system components to facilitate modular subassembly and part replacement.

2.5.2 Reliability

Provide only new components in current manufacturing production, manufactured to meet requirements specified herein, and free from characteristics and defects which affect appearance, or serviceability or render equipment unsuitable for the intended purpose. MTBF for component

shall not be less than 5000 hours.

2.5.3 Maintainability

Components shall be capable of being maintained using commercially available standard tools and equipment. Components shall be arranged and assembled to be readily accessible to maintenance personnel without compromising defeat resistance of IDS.

2.5.4 Availability

Provide components designed for continuous operation. Provide solid-state electronic components, mounted on printed circuit boards conforming to CEI 79-2;Ab and CEI 79-3. Boards shall be plug-in, quick-disconnect type. Circuitry shall not be so densely placed as to impede maintenance. Power-dissipating components shall incorporate safety margins of not less than 25 percent with respect to dissipation ratings, maximum voltages, and current-carrying capacity. Light duty relays and similar switching devices shall be solid-state type or hermetically sealed electromechanical. Electrical indicating instruments incorporated into system components shall conform to applicable provisions of CEI EN 60051-8.

2.5.5 Environmental Conditions

2.5.5.1 Interior Conditions

Equipment installed in environmentally protected interior areas shall meet performance requirements specified for the following ambient conditions:

- a. Temperature: 0 to 50 degrees C. Components installed in unheated security protected areas shall meet performance requirements for temperatures as low as minus 17 degrees C;
- b. Pressure: Sea level to 4,573 meters above sea level;
- c. Relative humidity: 5 to 95 percent;
- d. Fungus: Components shall be constructed of nonfungus nutrient materials or shall be treated to inhibit fungus growth; and
- e. Acoustical noise: Components shall be suitable for use in high noise areas above 100 dB, such as boiler rooms, power plants, and foundries without adversely affecting their performance.

2.5.5.2 Exterior Conditions

Components mounted in locations exposed to weather shall be housed in corrosion-resistant enclosures with appropriate environmental protection. Minimum protection degree [IP55] [____] as per CEI EN 60529;A1. Component performance shall not degrade because of improper housing design. Components in enclosures shall meet performance requirements when exposed to the following ambient conditions:

- a. Temperature: Minus 32 to 60 degrees C;

- b. Pressure: Sea level to 4,573 meters above sea level;
- c. Solar radiation: Six hours of solar radiation at dry bulb temperature of 60 degrees C including 4 hours of solar radiation at 0.00112 watts per square millimeter;
- d. Sand and dust: Wind driven for up to [9.6] [_____] km per hour;
- e. Rain: 50 mm per hour and 125 mm per hour cyclic with wind plus one period of 300 mm per hour;
- f. Humidity: 5 to 95 percent;
- g. Fungus: Warm, humid atmosphere conducive to the growth of heterotropic plants;
- h. Salt fog: Salt atmosphere with 5 percent salinity;
- i. Snow: Snow loading of 234 kg per square meter per hour; blowing snow of 22.5 kg per square meter per hour;
- j. Ice accretion: Up to 12.7 mm of radial ice;
- k. Wind: Up to 80 km/h with gusts to 106 km/h, except that fence sensors shall detect intrusions up to 56 km/h; and
- l. Acoustical noise: Components shall be suitable for use in high noise areas above 110 dB, such as flight lines, runup pads, and generator sites without adversely affecting their performance.

2.5.6 Electromagnetic Interference (EMI)

IDS components employing electromagnetic radiation shall be designed and constructed to provide maximum practical invulnerability to electronic countermeasures.

2.5.7 Electromagnetic Radiation (EMR)

NOTE: National Post Telephone and Telegraph is
normally the approving authority for EMR components.

Provide only IDS components which are CE listed and approved. Provide system components which are electromagnetically compatible, as per CEI EN 50130-4.

2.5.8 Interchangeability

Like components shall be physically and functionally interchangeable as complete items, without modification of either the original items or of other components with which the items are used.

2.5.9 Safety

IDS components shall conform to application rules and requirements of CEI 64-8; V1; V2 and CEI EN 50131-1.

2.5.10 Test Points

Test points, controls, and other adjustments inside enclosures shall be readily visible and accessible with minimum disassembly of equipment. Test points and other maintenance controls shall not be readily accessible to operator personnel.

2.5.11 Component Enclosures

Consoles, annunciator housings, power supply enclosures, sensor control and terminal cabinets, control units, wiring gutters, and other component housings, collectively referred to as enclosures, shall be formed and assembled to be sturdy and rigid.

2.5.11.1 Metal Thickness

Thicknesses of metal in cast and sheet metal enclosures of all types shall be as recommended by Manufacturer for alarm components. Sheet steel used in fabrication of enclosures shall be not less than 1.5 mm, except consoles may be 1.2 mm.

2.5.11.2 Doors and Covers

Doors and covers shall be flanged. Where doors are mounted on hinges with exposed pins, the hinges shall be of the tight pin type, or the ends of hinge pins shall be tack welded to prevent ready removal. Provide doors having a latch edge length of less than 600 mm with a single lock. Where latch edge of a hinged door is 600 mm or more in length, provide the door with a three-point latching device with lock; or alternatively with two locks, one located near each end. Covers of junction boxes provided to facilitate initial installation of the system shall be held in place by tack welding, brazing, or one-way screws.

2.5.11.3 Ventilation

Ventilation openings in enclosures and cabinets shall conform to requirements of CEI EN 60439-1.

2.5.11.4 Mounting

Unless otherwise indicated, sheet metal enclosures shall be designed for wall mounting with top hole slotted. Mounting holes shall be in positions which remain accessible when major operating components are in place and door is open, but shall be inaccessible when door is closed. Provide enclosure with [IP40] [____] minimum in accordance with CEI EN 60529;A1.

2.5.11.5 Labels

Labels shall be affixed to such boxes indicating they contain no

connections. These labels shall not indicate that the box is part of the intrusion detection system.

2.5.11.6 Enclosure Locks

Locks and key-lock-operated switches required to be installed on component enclosures shall be CE listed, round-key type with three dual, one mushroom, and three plain pin tumblers, or shall have a pick resistance equal to a lock having a combination of five cylinder pin and five-point three-position side bar in the same lock. Keys shall be stamped "U.S. GOVT. DO NOT DUP." Key-lock-operated switches shall be keyed differently and shall be two-position, with the key retractable from either position. Furnish two keys for each switch. Maintenance locks shall be of the one-way key-pull type arranged so that the key can be withdrawn only when the lock is in the locked position. Locks on components for maintenance access shall be keyed alike; only two keys shall be furnished for such locks. Deliver keys, tagged with metal tags, accompanied by a manufacturer's certificate which records the number of each key made.

2.5.12 Detection Sensors

Sensors shall detect opening of outside doors of the facility by unauthorized personnel or intruders with a probability of detection (pd) of 0.9 with a 95 percent confidence level and, as applicable, shall conform to CEI 79-2;Ab and CEI 79-3. Unless otherwise specified, required sensor power is plus 12 volts dc.

2.5.12.1 Interior Point Sensors

a. Door strike

(1) Balanced magnetic switches (BMS): Switches shall be recessed and shall have a minimum of two encapsulated reed switches. Switches shall activate when a disturbance in the balanced magnetic field occurs. Provide each BMS with an overcurrent protective device, rated to limit current to 80 percent of the switch capacity. BMS shall be rated for a minimum lifetime of one million operations. House the BMS components in nonferrous enclosure materials.

NOTE: Regarding the text below, show a junction box above each door so that slack in conductors serving switches cannot be accessed when switch mounting screws are removed. If building construction does not permit junction box location above doors, specify switches to be epoxy glued in place after preliminary testing.

(2) Recessed BMS: The recessed BMS shall consist of two preadjusted reed switches and two preadjusted magnets. Field adjustments in the fixed space between magnet and switch housing shall not be possible. Attempts to adjust or disturb the magnetic

field shall cause a tamper alarm.

2.5.13 Basic Automated Access Control

Provide basic automated access control subsystem based upon a modular distributed microprocessor architecture complete with access control keypad.

2.5.13.1 Keypad Access Control Devices

**NOTE: Specify only one type of access control card.
Be sure card type and card readers are compatible
with each other.**

Devices shall be tamper alarmed, tamper and vandal resistant, and solid state, containing no electronics which could compromise the access control subsystem should the subsystem be attacked. Devices shall be surface, semiflush, pedestal, or weatherproof mountable as specified for each individual location. Each device shall contain a visual display, mounted on the face, to indicate access or exit request processing, request approval, and request denial. Keypads shall contain an integral 12-digit tactile keyboard with digits arranged in numerical order. Keypad shall be a stand-alone device.

2.5.14 Control Communicators

Control communicator shall be CE listed and shall conform to CEI 79-2;Ab, CEI 79-3, and CEI 79-11 as applicable. Communicator shall provide for connection and control of IDS sensors and shall report status to multiple function keypads. Provide control communicator in a locked enclosure that is tamper protected so that openings cannot be created to defeat the system.

2.5.15 Functions

Each control communicator shall provide power and data interfaces to and control of a group of up to 8 sensor zones and shall perform the following functions:

- a. Continuously monitor status (secure or alarm) of sensor zone status outputs connected to each control communicator zone input by monitoring the current through the end-of-line resistor.
- b. Continuously supervise lines connecting each sensor zone status output to each control communicator zone input.
- c. Retain activated sensor zones in memory. Display activated sensor zones. Require a command to be entered on keypad to clear memory.

2.5.16 Features

- a. Multiple function keypad, suitable for remote mounting from the control communicator and having light emitting diode (LED) or liquid crystal display (LCD) readout of alarm and trouble

conditions by zone. Alphanumeric English language display, with keypad programmability, and EE-PROM memory are preferred. Alarm indications shall be visual and audible.

- b. Trouble indications distinguishable from intrusion alarms.
- c. Minimum of four zones selectable as entry and exit or interior follower (time delayed interior zone when entry is gained through normal entry and exit point).
- d. Complete system test activated as the keypad.
- e. Adjustable entry and exit delay times.
- f. Integral battery charger.
- g. Rechargeable 6 ampere-hour minimum sealed lead-acid battery.
- h. Minimum of three relay outputs, fused.
- i. Siren/bell output, fused and supervised.
- j. Capability for a minimum of two multiple function keypads.
- k. Capability for a minimum of seven assignable pass coded programmable from suppressed master code.
- l. Designated Access key pads shall by-pass zone alarm for 5 seconds to allow access. Key pads shall have four digit access code. Access key pads shall be tamper alarmed.

2.5.17 Audio Alarm

NOTE: Alarm shall be distinct from all other building alarms.

Provide CE listed [buzzer] [siren] [horn] type audible alarm rated for 6 to 12 volts DC and having a sound output of [84 dB] [103 dB] minimum. Alarm shall conform to CEI 79-2;Ab. Provide alarm in steel enclosed, weather-resistant box having tamper switches on front cover and on back of box.

2.5.18 Communications Cable

Provide as required by manufacturer.

2.5.19 Closed-Circuit Television (CCTV) System

NOTE: Scene illumination shall be even across the field of view of the camera, with a maximum light to dark ratio of 8 to 1. Minimum illumination level

shall be 11 lux.

NOTE: For visual assessment of IDS alarms, specify the optimum number of monitors for the number of cameras required. It is difficult to view and respond to too many monitors. Typically, for six cameras or less, use one monitor per camera. For a larger number of cameras, consider sequential switchers, four quadrant multiplexers, or a combination of both.

Provide CCTV components to provide visual assessment of activities. Subsystem shall continuously view remote areas with video cameras and display the areas automatically upon IDS alarm, or upon operator selection. Provide the number of alarm monitors indicated. Video switcher shall be capable of automatic and manual operation. Alarm monitors shall display alarm areas only when an alarm condition exists. In systems where monitors may display more than one camera scene, provide on-screen camera identification. Subsystem shall be composed of components which are integrated to provide a quality video system. The scene from each camera shall appear clear, crisp, and stable on the respective monitor during both daytime and nighttime operation. Horizontal resolution shall reflect quality video components, and system shall have a minimum of 5 MHz bandwidth. Component equipment shall minimize both preventive and corrective maintenance. Components shall be compatible with other components and with system as a whole and shall, to the greatest extent possible, be supplied by the same manufacturer.

2.5.19.1 Cameras

- a. Except as specified herein, CCTV camera shall comply with CEI EN 50132-7 and CEI EN 50132-2-1 for standard monochrome camera and shall:
 - (1) Consist of support structure, base plate, lens plate, and printed circuit boards with electronic components;
 - (2) Be identified with the manufacturer's part number, model number, lens installed, and a serial number;
 - (3) Operate over a voltage range of 100 to 240 volts ac or low voltage ac at 50 Hz;
 - (4) Have electronic circuits which use solid-state devices. When object distance resolution is acceptable, a solid-state imaging device may be used;
 - (5) Be constructed to provide rigid support for electrical and optical systems so that unintentional changes in alignment or microphonic effects will not occur during operation, movement, or lens adjustments;

(6) Have standard "C" lens mount;

(7) Be designed to protect personnel from exposure to high voltage during operation and adjustment; and

(8) Meet requirements specified herein with either side of the power source line grounded. Minimum essential requirements shall include the following:

(a) Sensitivity: Produce a 100 Institute of Radio Engineers (IRE) unit output with a minimum faceplate illumination of 0.5 lux.

(b) Signal-to-noise ratio: Show a signal-to-noise ratio of not less than [40] [____] decibels (dB) when present at the specified sensitivity and measured at 1.0 gamma.

(c) Resolution: Provide a horizontal resolution of at least [460] [____] lines in Zone 1 with automatic gain and bandwidth at the specified sensitivity.

(d) Gray scale: Produce at least [10] [____] shades of gray at the minimum specified sensitivity and at 1.0 gamma, using EIA standard gray scale chart.

(e) Bandwidth: Be a minimum of [10] [____] MHz [+0, -0.5] [____] dB.

(f) Gamma: Provide gamma selections of not less than [1.0] [____] and [0.7] [____].

(g) Be solid state. Geometric distortion: Camera shall be accurate to within a maximum 1.5 percent geometric distortion and to within 2 percent.

(4) Be solid state.

b. Camera signals: CCTV camera vertical sync signal shall be phase-locked to the ac power line frequency and shall remain line locked at 50 Hz, plus or minus 0.3 Hz. Synchronization at the video output shall conform to the timing specified by CEI EN 50132-7. Camera shall operate on internally generated sync automatically upon loss of external sync.

c. Camera resolution

(1) Exterior: Horizontal resolution shall be [650] [____] TV lines in the center, greater than [500] [____] TV lines in three corners, and greater than [400] [____] TV lines in the fourth corner. Vertical resolution shall be [350] [____] TV lines in the center. Resolution shall be maintained over the specified input voltage and frequency range, and shall not vary more than [100] [____] TV lines from minimum specification over the specified operating temperature range. Composite video output level shall

be automatically maintained to within plus or minus 0.1 volt over scene changes of [2.69] [____] lux to [107,600] [____] lux with lenses of f/1.4 and greater.

(2) Interior: Horizontal resolution shall be at least [400] [____] TV lines. Vertical resolution shall be at least [350] [____] TV lines. Resolution shall be maintained over the specified input voltage and frequency range.

d. Camera sensitivity and dynamic range

(1) Faceplate illumination shall be referenced to color temperature of 2854 K.

(2) Nominal 0.53 lux highlight illumination on the faceplate shall produce 100 IRE units of picture video output. The rms noise at the output with 0.5 lux shall be equal to or less than 0.011 volt with a signal-to-noise ratio of 36 dB or greater.

(3) Nominal 0.053 lux highlight illumination on the faceplate shall produce 100 IRE units of picture video output from a 10:1 (20 dB) video gain increase from automatic gain control (AGC) action. The rms flat noise with 0.0538 lux shall be equal to or less than 0.011 rms volt with signal-to-noise ratio of 16 dB or greater and resolution shall be greater than 200 lines at center of picture.

(4) Automatic line control (ALC) and AGC shall maintain highlight video output at 100 plus or minus 10 IRE units when focused on a fixed average picture level (APL) test chart of 20 percent white, 80 percent black, and highlight ranges between 107,600 lux and a minimum that gives 0.05 lux on the faceplate.

(5) ALC and AGC shall maintain highlight video output at 100 plus or minus 10 IRE units with APL between 0.2 and 0.8 in a constant highlight level greater than 0.05 lux on the faceplate.

(6) ALC response of fixed focus lenses shall stabilize the video level within 5 seconds after a change in light between maximum and minimum.

(7) Video black level shall be maintained at a setup level of 7.5 plus or minus units, with black area equal to 10 percent or greater in the scene.

(8) Blanking level shall be a fixed reference at or near zero volts.

(9) White peaks: Bright going video white output peaks shall reach a level of at least 120 IRE units before clipping.

(10) Black peaks: Dark going video output peaks shall be clipped to prevent them from going below blanking level by less

than 5 IRE units.

- e. CCTV lenses: Provide lenses with automated light level metering device and an auto-iris. Provide each lens with a metal density spot filter. Light adjustment by the automatic metering device shall be a weighted average rather than a simple average or a peak response. Provide lenses for both [25] [____] mm and [16.9] [____] mm format cameras. Provide lenses which are mountable with standard "C" mounts. Provide lens for hallway cameras with [7.6] [____] degree horizontal and [5.7] [____] degree vertical image unless otherwise indicated. Standard lenses for the rest of the cameras shall have [97.9] [____] degree horizontal and [73.9] [____] degree vertical image. Image angle may vary by plus or minus 5 percent.
- f. Auxiliary CCTV camera equipment: Equipment shall consist of camera mounts and housings with environmental protection as applicable for each camera. Camera mounts shall be heavy duty industrial type, shall provide stable support for the camera, and shall be the configuration specified for each individual camera location. Housing shall protect the camera to ensure continuous 24-hour per day operation under specified environmental conditions. Housing shall be constructed of a durable material. Access to housing shall allow for camera and auto-iris removal and replacement within plus or minus 0.0087 rad, both vertical and horizontal centerline alignment. Sealed housings shall be pressurized with dry nitrogen, or contain two units of desiccant in the camera body area. Install a 10, 20, and 30 percent humidity level indicator strip in a position that allows inspection through the enclosure faceplate. Where used, thermostatically controlled heaters shall be located near the auto-iris and faceplate and near the midsection of the camera body. Where ventilation blower is used in housing to prevent high temperature, it shall be thermostatically controlled. Hinged louvers shall close over blower exhaust when blower is off. For exterior cameras, video, sync, tamper, and power cables shall enter camera housing via weatherproof fittings. Entry into housing shall not interfere with housing heaters or blower operation. Provide terminal strips for power inside environmental housings to distribute 220 volts ac for the camera, heater, and blower, as applicable.

2.5.19.2 Video Signal

Requirements apply to the video signal present at the video monitor input. Standard system video level shall be one volt peak-to-peak (Vp-p) composite video and sync. Standard system impedance shall be 75 ohms over the frequency range 0 to 5 MHz. System timing and synchronizing waveform shall be according to CEI EN 50132-7 and CEI EN 50132-2-1. Peak-to-peak amplitude of the composite TV waveform shall be one volt and shall be referred to as standard system video level. Waveform shall be measured in IRE units on the IRE scale graticule where 140 IRE units represent one volt. Synchronizing pulse amplitude of a composite video signal of standard system video level shall be measured from blanking level to negative peak

of the sync pulse and shall be 40 IRE units, 0.3 volt nominal. Video amplitude of a composite video signal of standard system video level shall be measured from blanking level to reference white level and shall be 100 IRE units, 0.7 volt nominal. Picture setup of a composite video signal of standard system video level shall be 7.5 IRE units, 7.5 percent of the video amplitude. Pulse overshoot shall be less than 2 percent of the pulse amplitude. Video signal voltage frequency response shall be measured from camera output to video monitor input. It shall be plus or minus 2 dB from 60 Hz to 5 MHz and not more than 3 dB down at 6 MHz. The low frequency distortion shall be measured for every camera output over every normal program path to the input of the associated monitor. Distortion shall be less than 2 percent at line and field rates. Peak-to-peak signal-to-rms noise ratio shall be measured for every camera output via the normal program path at input of the associated monitor. Terminate circuits, except the one under test, at inputs and outputs. Hum and noise shall be 60 dB below 1.0 Vp-p.

2.5.19.3 Video Switchers

Switching shall interface 64 multiple video signals and cameras, with up to 16 monitors. Switching shall be timed to occur during the video signal blanking period with vertical interval switching. A sequential monitoring capability shall permit alarm reporting and display subsystem operation to view zones in numerical order at an operator adjustable scan rate. Individual cameras shall be capable of being called up to display zones on the video monitors. Manual controls for camera switching shall be on front panel of switcher. Switcher shall be configured for desk top console operation. Performance requirements shall be as follows:

- a. Bandwidth: 30 Hz to 10 MHz with less than plus or minus 0.5 dB deviation from a flat response;
- b. Tilt: Less than one percent;
- c. Differential phase: Less than [0.0174] [____] rad at 10 to 90 percent automatic phase level (APL);
- d. Differential gain: Less than one percent at 10 to 90 percent APL;
- e. Crosstalk: [72] [____] dB at [3.58] [____] MHz;
- f. Gain: Unity, adjustable plus or minus [3] [____] dB;
- g. Level: 1.0 Vp-p;
- h. Signal-to-noise ratio: [60] [____] dB below 1.0 Vp-p for the frequency band from 50 Hz to 5 MHz;
- i. Video connectors: UHF or BNC; and
- j. Provide with one keyboard controller capable of controlling views from 64 cameras from a remote location.

2.5.19.4 Video Transmission

Transmission shall be by 75-ohm coaxial cable or fiber optics dedicated to the associated circuit. Interior cable shall be installed in conduit unless indicated otherwise. Cable shall be designed for the installation method intended. Aluminum center core cables shall not be used.

2.5.19.5 Video Monitors

a. Except as specified herein, design video monitors as follows:

- (1) Video monitors shall be designed for continuous operation and shall incorporate printed circuit modular construction.
- (2) Monitor design shall provide for easy replacement of printed circuit modules.
- (3) Electronic circuits shall use solid-state devices with the exception of the cathode ray tube (CRT).
- (4) Each monitor shall be constructed to provide rigid support for electrical systems so that unintentional changes in alignment or microphonic effects will not occur during operation or movement.
- (5) Circuit design shall incorporate safety margins of not less than 25 percent where possible, with respect to power dissipation ratings, voltage ratings, and current carrying capacity.
- (6) Provide monitors with a rectangular picture tube that nominally measures [9][12][17][20] inches minimum, diagonally.
- (7) Provide adequate safeguards to protect personnel from exposure to high voltage during operation or adjustment.
- (8) Front panel controls shall include a monitor power switch, horizontal hold, vertical hold, height, contrast, brightness, and focus.
- (9) Monitors shall have the following minimum essential requirements:
 - (a) Resolution: Horizontal resolution of not less than 650 TV lines.
 - (b) Geometry: No point in the active raster shall deviate from its correct position by more than 2 percent of raster height.
 - (c) Gray scale: Reproduce not less than 10 discernible shades of gray.

b. Mounting and identification

- (1) Mount the monitor CRT and other devices subject to burnout or short operating life to facilitate easy replacement.

- (2) Label the printed circuit board's function and provide component numbers or markings.
- (3) To maintain a standard quality and reliability, components shall be conservatively rated.
- (4) Mount monitors in a frame for mounting in a desk top console.

c. Video and signal input

- (1) Monitors shall operate with video input requiring a one Vp-p nominal composite video signal switchable to either loop-through or internal 75-ohm terminating impedance.
- (2) Signal input shall be UHF or BNC connectors.

2.5.19.6 Auxiliary Equipment

Equipment shall consist of the items specified below.

- a. Video date/time generator: Generator shall insert the year, month, day, hour, minute, and second information on the video signal applied to the input. Display shall be capable of character heights adjustable from 5 to 15 percent of picture height. Date/time generator shall automatically display proper number of days in each month and automatically compensate for leap years. Provide looping inputs to prevent picture loss when the generator is turned off or fails. Operator adjustments shall include size, horizontal and vertical position, brightness, and selection of horizontal or stacked format. Position controls shall permit date/time display information to be located any place within the video picture. The horizontal or stacked selection shall allow the time numerals to be placed beside the date numerals or time above the date. Performance requirements shall be as follows:
 - (1) Character format: Seven-bar matrix, white with black outline. Zoom size control, 2:1 aspect ratio, height 5 to 15 percent of picture height;
 - (2) Timing accuracy: Power line accuracy. No cumulative error;
 - (3) Standby: Preserve timing up to 10 minutes;
 - (4) Video input: Looping. Passive circuit to provide flat response to 10 MHz with no deterioration of color or monochrome signals. Random or positive interlace. Composite video;
 - (5) Video connectors: BNC or UHF; and
 - (6) Mounting: Generator shall be an integral part of Multiplexer.
- b. Video sync generator: Generator shall operate at a frequency of 31.5 kHz with integrated circuitry for counting and timing

functions. Generator shall have its own internal crystal oscillator for accurate synchronization signals if ac power fails. Under normal conditions, the output shall be phase-locked to the 50 Hz power frequency. Performance requirements shall be as follows:

- (1) Pulse waveform: [525] [____] line, 50 Hz;
 - (2) Pulse amplitude: [4] [____] Vp-p plus or minus 0.5 volt into a 75-ohm load pulse;
 - (3) Pulse outputs: Sync, blanking, and horizontal and vertical drive;
 - (4) Pulse jitter: Less than one nanosecond;
 - (5) Pulse rise and fall time: [120] [____] plus or minus [20] [____] nanoseconds;
 - (6) Mounting: Enclosed cabinet for desk top console.
- c. Video sync distribution amplifier: Amplifier shall ensure proper phase and amplitude of composite video signals where signals input to switcher. Performance requirements shall be as follows:
- (1) Inputs: High impedance loops through [50,000] [____] ohm minimum unbalanced one to 5 volts p-p composite return loss (on or off) of [40] [____] dB minimum to [5] [____] MHz;
 - (2) Outputs: 75 ohms. Level adjustable 0.5 to 2 Vp-p dc couplings (base level at zero volts pulse negative). Isolation between outputs of [40] [____] dB minimum to [5] [____] MHz;
 - (3) Rise time: [100] [____] plus or minus [20] [____] nanoseconds;
 - (4) Ringing: One percent maximum;
 - (5) Tilt, H & V: One percent maximum;
 - (6) Hum and noise: Greater than [60] [____] dB below one Vp-p;
 - (7) Delay: Adjustable [0.5] [____] to [5.0] [____] microseconds;
 - (8) Delay stability: [100] [____] nanoseconds maximum;
 - (9) Adjustments and indicators level: adjustable 3 Vp-p; delay: adjustable [0.5] [____] to [5.0] [____] microseconds; and output: pulse presence indicator; and
- d. Camera identifiers: Video signal from each camera shall be identified by a two-digit (minimum) number. Device shall be a stand-alone identifier or internal to another piece of equipment (camera, switcher, etc.) and shall meet the following requirements:

- (1) Character format: 5 by 7 matrix, white;
 - (2) Number of digits: Two minimum, 00 to 99;
 - (3) Horizontal position: Screwdriver adjust;
 - (4) Vertical position: Screwdriver adjust;
 - (5) Character retention: Either hard wired or battery backup for 15 minutes minimum;
 - (6) Connectors: UHF or BNC; and
 - (7) Inputs: Looping: Identifier shall not interfere with video signal quality when in line with power on or off.
- e. Video tape recorder: Recorder shall be of the helical scan format and shall accept standard 12.7 mm VHS video cassettes. Time for a stable picture lock from the standby mode shall be 2 seconds or less. Recorder shall provide continuous recording times of 2 hours per cassette. Time lapse recording up to 24 hours selectable shall be possible. Tape motion controls shall be pushbuttons. Provide for remote starting and stopping of video recorder. Recorder shall be capable of stop motion and slow motion. Provide a tracking control to ensure precise tracking of playback. Provide 10 standard 12.7 mm VHS video cassettes. Mount recorder in a desk top console.
- (1) Video performance requirements shall be as follows:
 - (a) Bandwidth: [30 Hz to 3.5 MHz] [____] Hz to [____] MHz plus or minus one dB, down no more than [4] [____] dB at [5] [____] MHz;
 - (b) Signal-to-noise ratio: [46] [____] dB peak-to-peak composite signal to rms noise with high energy tape;
 - (c) Differential gain: 10 IRE units maximum deviation (10 to 90 percent APL);
 - (d) Input level: [0.5] [____] to [2.0] [____] Vp-p, 1.0 Vp-p nominal;
 - (e) Output level: One Vp-p composite video into 75 ohms;
 - (f) Horizontal tilt: Less than plus or minus one percent;
 - (g) Vertical tilt: Less than plus or minus 5 percent.
 - (h) Resolution: 350 TV lines.
 - (i) For 16 cameras in 24 hour recording mode, there shall be a maximum 5.8 second delay rated between updates for an individual

camera. For less than 16 cameras, the delay rate shall be less than 5.8 seconds.

(2) Audio performance requirements shall be as follows:

- (a) Number of channels: One minimum;
- (b) Bandwidth: Audio one [75] [____] Hz to [10] [____] kHz plus or minus [4] [____] dB, audio two [250] [____] Hz to [7.5] [____] plus or minus [4] [____] dB.
- (c) Signal-to-noise ratio: [40] [____] dB relative to [3] [____] percent total harmonic distortion (THD) level at one kHz;
- (d) Flutter: Less than [0.25] [____] percent rms [0.5] [____] to [250] [____] Hz;
- (e) Input: Microphone: [0.4] [____] mV minimum, [200] [____] ohms. Line: minus 20 to 16 dBm, [600] [____] ohms unbalanced or balanced;
- (f) Output: Balanced or unbalanced into 600 ohms.

f. Sixteen quadrant multiplexer: Unit shall digitally capture full video from sixteen unsynchronized sources and record them simultaneously onto a standard 12.7 mm VHS tape. The multiplexer shall be capable of displaying up to sixteen views on a single screen. In playback mode, each of the previously recorded camera inputs can be viewed full screen individually or simultaneously in multi-screen modes.

(1) Video performance requirements shall be as follows:

- (a) Input level: One Vp-p nominal into 75 ohms from a [525] [____] line, [60] [____] fields per second source;
- (b) Output level: One Vp-p nominal into 75 ohms;
- (c) Alarm inputs: [16] [____], rear panel mounted;
- (d) Alarm outputs: Relay contacts, rear panel mounted;
- (e) Video inputs: [16] [____], looping;
- (f) Switching: [16] [____] position, front panel mounted;
- (g) Memory: [720 by 484] [____ by ____] pixels, minimum, digital;
- (h) Gray scale: 64-level;
- (i) While recording, the multiplexer shall be capable of displaying a single camera and any multi-screen view without interrupting the normal recording sequence; and

(j) Shall be able to provide signals at a rate compatible with recording rate in stated in paragraph entitled "Video Tape Recorder" to provide performance as stated therein.

2.5.20 Power Supply

2.5.20.1 Power Supply for Equipment

Provide all CCTV and Sound Recording equipment with standard 10/16 AMP plug and cord.

2.5.20.2 Power supply for Cameras

Provide CE listed power supply units to provide power to cameras. These units shall provide surge protection. Provide enough units to provide power to 64 cameras.

2.5.21 Alarm Reporting and Display

Display shall integrate signals from and provide control to IDS sensors. Major components shall be as follows:

2.5.21.1 Control Units

Unit shall provide for connection and control of the IDS sensors. Control unit enclosure shall be tamper protected so that openings cannot be created to defeat the system.

- a. Each control unit shall provide the power and data interfaces to and control of a group of up to eight sensor zones and shall perform the following functions:

- (1) Continuously monitor status (secure or alarm) of sensor zone status outputs connected to each control unit zone input by monitoring current through the end-of-line resistor.

- (2) Continuously supervise lines connecting each sensor zone status output to each control unit zone input.

- (3) Respond immediately to alarm reporting and display unit interrogation.

- (4) Generate immediately up to two control output signals when commanded by the alarm reporting and display unit.

- (5) Report sensor zone status to the local annunciator unit.

- b. Provide microprocessor based control units of modular assembly to facilitate expansion to maximum sensor zone monitoring and control capability, as well as maintenance. Control units shall have electronic diagnostic aids to facilitate troubleshooting and maintenance. Control units shall be capable of interfacing with other control units to modularly increase the number of sensor

zones controlled from a single point. Provide control units in locked metal enclosures to provide protection for the environment in which installed. Control unit shall be capable of functioning independently of the central alarm reporting and display unit.

2.5.22 Audio Recording Equipment

2.5.22.1 Central Control and Recording Center

Provide a desk top digital recording system consisting of 486 CPU based system controller. The system shall have the following capabilities and components:

- a. Up to 16 hours of "Instant Recall".
- b. A minimum of 40 Record/Play back channels. System shall use 34 channels and the other six shall be spare.
- c. Color CRT and 101 key computer keyboard.
- d. Two Internal 8mm Tape drives with up to 1456 channel/hours of recording capacity. Tapes used shall be 8mm industry standard digital cartridge tape. Rewind time shall be less than 2 minutes. Selectable 4-to-1, 2-to-1, and 1-to-1 compression capability.
- e. Frequency Responses: [300-3] [____], [400] [____] Hz.
- f. Sample Rate: [8] [____] kHz, 8 bit, in LAW, 64 kbits/sec, PCM compatible, 32 kbits/sec, and 16 kbits/sec ADPCM.
- g. System shall record input from all microphones simultaneously. For 40 microphones, recording capacity shall be 36 hours minimum.
- h. Instant playback search time in record mode. Less than 2 minutes search time for audio file in playback mode.
- i. Search Criteria:
 - Time/Date
 - Call Duration
 - Channel No.
 - Recorder ID
- j. Memory: 200 MB hard drive minimum, 8 MB RAM minimum. Provide RAM in one SIMMS module and leave all other memory slots open.
- k. Password up to 14 characters. Shut down after 5 wrong attempts. Provide with internal LOCK/UNLOCK operation switch.
- l. Audio and visual alerts of system failures, end of tape, and wrong operation.
- m. Operating temperature 4.4 degrees C to 45 degrees C with relative humidity of 80 percent non-condensing.

n. Software Requirements: Provide with the most current operating system available. Also, provide with the software necessary to provide operation of audio recording components specified herein. The software shall be specifically designed for audio recording applications of the sort specified herein.

o. Provide with one 3.5 inch/1.44 MB external floppy drive.

2.5.23 Microphones

Microphones shall contain pre-amplifiers and be capable of omni-directional pick-up. Housing shall be high impact polystyrene or equal. Exterior mounted microphones shall be weather resistant and be capable of operating in the environmental conditions specified in Environmental Conditions paragraph.

PART 3 EXECUTION

3.1 EQUIPMENT INSTALLATION

CEI 79-2;Ab, CEI 79-3, and the appropriate installation manual for each equipment type. Components within the system shall be configured with appropriate "service points" to pinpoint system trouble in less than 20 minutes.

3.1.1 Cable and Wire Runs

CEI 64-8; V1; V2 and Section 16402, "Interior Distribution System," and as specified herein. Conduits including flexible metal and armored cable shall terminate in the sensor or device enclosure. Ends of conduit shall be fitted with insulated bushings. Exposed conductors at ends of conduits external to sensors and devices are not acceptable.

3.1.2 Soldering

UNI EN 12534.

3.1.3 Galvanizing

Ferrous metal shall be hot-dip galvanized in accordance with UNI EN ISO 1461. Screws, bolts, nuts, and other fastenings and supports shall be corrosion resistant.

3.1.4 Fungus Treatment

Completely treat system components for fungus resistance. Do not use treated materials containing mercury-bearing fungicide. Treating materials shall not increase flammability of material or surface being treated. Treating materials shall not cause skin irritation or other personnel injury during fabrication, transportation, operation, or maintenance of equipment, or during use of finished items when used for the purpose intended.

3.1.5 Conduit

Install in accordance with CEI 64-8; V1; V2 and Section 16402, "Interior Distribution System."

3.2 ADJUSTMENT, ALIGNMENT, SYNCHRONIZATION, AND CLEANING

Subsequent to installation, clean each system component of dust, dirt, grease, or oil incurred during installation or accrued subsequent to installation from other project activities, and prepared for system activation by manufacturer's recommended procedures for adjustment, alignment, or synchronization. Prepare each component in accordance with appropriate provisions of component installation, operations, and maintenance manuals. Remove large vegetation that may sway in the wind and touch fencing.

3.3 FIELD QUALITY CONTROL

3.3.1 System Operational Test

Test shall ensure that the requisite degree of Audio/video Monitoring and intrusion detection is provided. Initially, test each sensor and subsystem component individually. When the function of each component within a particular subsystem such as each sensor within a particular zone is verified, certify that subsystem of the entire IDS as satisfactorily meeting required specifications. Test each subsystem similarly until each detection zone has been certified. When subsystem certification is complete, test entire integrated system to ensure that subsystem elements are compatible and function as a complete system. Integrated system test shall be accomplished in linear fashion, end-to-end, and shall verify that each simulated intrusion performed within each detection zone produces an appropriate alarm or signal. Integrated system test shall also verify that alarm is correctly annunciated at the local annunciator unit and that designated cameras are exclusively recorded. Provide for approval, not later than 30 days prior to formal inspection and test, a detailed operational test plan of how each component, subsystem, and entire system will be tested. When tests are complete and corrections made, submit a signed and dated certificate with a request for formal inspection and tests.

3.3.2 Formal Inspection and Test

3.3.2.1 Final Inspection

Contracting Officer will witness formal tests after receipt of written certification that preliminary tests have been completed and that system is ready for final inspection. Manufacturer's technical representatives shall be present for the final inspection and test. Repeat preliminary tests and functional and operational tests, conducted as requested by the Contracting Officer. Correct defects and conduct additional tests to demonstrate that system conforms to contract specifications.

3.3.2.2 System Final Test

Test each sensor within a detection zone and then test the entire zone in accordance with applicable test procedures in the test plan for sensors

incorporated within that zone. As the test in that zone is proceeding, modifications or adjustments are prohibited. If, subsequent to the test, a modification or adjustment is necessary, retest the zone in the presence of the authorized representative of the Contracting Officer. Test other components individually within each subsystem. Component or subsystem failure shall require retesting after needed repairs or adjustments have been accomplished. For testing purposes, computers, data managers, graphic displays, control units gathering panels and nonsensor-related cabling will be considered part of the central alarm reporting and display console. The integrated system test shall commence only when subsystem tests have been completed. In the interest of efficiency, major elements in a subsystem may be tested even if corrections for minor elements have not been completed. Testing of minor elements will be accomplished upon completion.

Only when subsystem elements have been tested can subsystem be certified as complete. When testing is complete, test plan, together with procedures and data sheets, shall become the substance of the final acceptance report.

Test report documents and verifies the Government's acceptance and approval of equipment and installation required by the contract.

3.3.2.3 Fuses and Lamps

Replace blown fuses and burned out lamps during testing and will have on hand, prior to scheduling tests, not less than six spare lamps and fuses for each type, size, and rating of fuses and lamps used in the equipment provided under this section. Turn spare fuses and lamps not used during testing over to the Contracting Officer.

3.3.2.4 Training Operating and Maintenance Personnel

Furnish instruction for operating staff in system operation and operator troubleshooting and preventive maintenance procedures. Instruction shall consist of 3 man-days, 8 hours per day, and shall be held during normal duty hours. Commence instruction after system is fully operational, and complete instruction prior to system acceptance and turnover to the Government. Furnish maintenance instruction for Government maintenance personnel in adjustment, operation, and maintenance of each system equipment. Attendance at equipment manufacturer's recommended maintenance training schools may be substituted for this training. Costs associated with such schooling, less travel and per diem, shall be borne by the Contractor. Complete maintenance instruction prior to system acceptance and turnover to the Government.

-- End of Section --